(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

REVISED VERSION

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
14 October 2004 (14.10.2004)

PCT

(10) International Publication Number
WO 2004/087944 A1

(51) International Patent Classification[7]: C12Q 1/42, G01N 33/50

(21) International Application Number: PCT/GB2004/001436

(22) International Filing Date: 1 April 2004 (01.04.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0307470.5 1 April 2003 (01.04.2003) GB

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

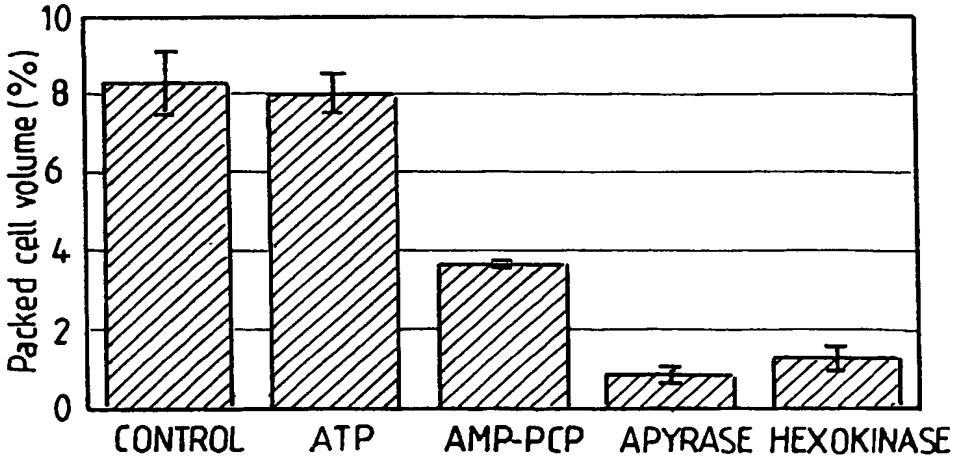
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the revised international search report: 9 December 2004

*[Continued on next page]*

(54) Title: IMPROVEMENTS IN OR RELATING TO VIABILITY




(57) Abstract: Disclosed is a method of killing a plant cell or plant cells by activating a cell death pathway, which pathway is activatable by depletion of extracellular NTP, especially ATP, available to the cell for hydrolysis by cellular NTPase (especially ATPase) enzymes.

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(15) **Information about Correction:**
see PCT Gazette No. 50/2004 of 9 December 2004, Section II

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

# INTERNATIONAL SEARCH REPORT

GB2004/001436

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12Q1/42 G01N33/50

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G01N C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ, BIOSIS, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | WO 01/64859 A (UNIV TEXAS)<br>7 September 2001 (2001-09-07)<br>page 9, line 33 - page 10, line 1<br>page 37, line 7 - line 28; example 7 | 1-7,10,<br>12-14,29 |
| X | US 2002/160915 A1 (ROUX STAN J ET AL)<br>31 October 2002 (2002-10-31)<br>p.16, paragraph (0096);example 7 | 1-7,10,<br>12-14,29 |
| A | US 6 448 472 B1 (ROUX STAN J ET AL)<br>10 September 2002 (2002-09-10)<br>the whole document | 1-7,10,<br>12-14,29 |

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[X] Further documents are listed in the continuation of box C. [X] Patent family members are listed in annex.

° Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 27 July 2004 | 05. 10. 2004 |

| Name and mailing address of the ISA | Authorized officer |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016 | Jacques, P |

Form PCT/ISA/210 (second sheet) (January 2004)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| A | THOMAS C ET AL: "A ROLE FOR ECTOPHOSPHATASE IN XENOBIOTIC RESISTANCE" PLANT CELL, AMERICAN SOCIETY OF PLANT PHYSIOLOGISTS, ROCKVILLE, MD, US, vol. 12, April 2000 (2000-04), pages 519-533, XP002942331 ISSN: 1040-4651 the whole document | 1-7,10, 12-14,29 |

# INTERNATIONAL SEARCH REPORT

PCT/GB2004/001436

## Box II. Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 15-16, 18-20
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
see annex

**Remark on Protest**

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 15-16, 18-20

The subject-matter of claims 15 and 16 is so unclear (Art. 6 PCT) that no meaningfull search of the said claims is possible. The said claims relate, respectively, to a method and a composition which are not defined by any features whatsoever making it impossible to determine the matter for which protection is sought.
Consequently the said claims cannot be searched.

Present claims 18 to 20 relate to a method of preserving the viability of a plant cell exposed to viability-threatening extracellular NTP depletion, comprising administering a viability-preserving substance comprising a nucleotide sequence and/or the polypeptide(s) encoded thereby. The said nucleotide and/or polypetide(s) being only defined by reference to a desirable characteristic or property, namely which has the effect, when expressed in the plant cell, of tending to increase the extracellular concentration of NTP (especially ATP). However, no features characterizing the said nucleotide sequence and/or polypeptide(s) are given in the claims. The skilled man is therefore unable to identify which substance falls under the scope of the said claims. Known sequences might well be encompassed in the said definition. The claims lack thus clarity (Art. 6 PCT) as to render a meaningful search over the whole of the claimed scope impossible.
Similarly, the description refers only to desirable properties of the said polypeptides namely nucleotide sequences which encode the components of a biochemical pathway which result in elevated levels of extracellular NTP (p. 13, second paragraph) without giving any technical features characterizing the said sequences and/or polypeptides.
Consequently, claims 18 to 20 are so unclear (Art. 6 PCT) that no meaningful searh of the said claims is possible.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-7, 10, 12-14, 29 (all partially)

Method of controlling the viability of a plant cell by contacting the plant cell or cells with an inhibitor of ectoATPase.
A composition comprising the said inhibitor.
Use of the said inhibitor as an active agent in the preparartion of a herbicidal composition.

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2. claims: 1-7, 10, 12-14, 29(all partially), 8-9, 30 (all fully)

Method of controlling the viability of a plant cell by contacting the plant cell or cells with a non hydrolizable NTP analogue.
A composition comprising said analogue.
Use of the said analogue as an active agent in the preparartion of a herbicidal composition.

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3. claims: 1-6, 10, 12-14 (all partially)

Method of controlling the viability of a plant cell by contacting the plant cell or cells with an enzyme which hydrolysis NTP (apyrase, hexokinase).
A composition comprising the said enzyme.

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4. claim: 17 (fully)

Method of preserving the viability of a plant cell or cells exposed to viability-threatening extracellular NTP depletion, the method comprising the step of administering a viability-preserving NTP.

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5. claims: 21-28 (fully)

Method of altering the viability of a plant or part thereof, the method comprising the step of introducing into the plant or part thereof a recombinant nucleic acid molecule comprising a sequence of at least 200 bases having 90% sequence identity with a sequence encoding one of the polypeptide listed in table 3.
Use of the said nucleic acid in the preparation of a composition.
A trangenic plant produced by the above method.

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6. claims: 1-5, 10, 12-14 (all partially), 11, 31-33 (all fully)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Method of controlling the viability of a plant cell by contacting the plant cell or cells with an inhibitor or antagonist of one or more of the polypeptide of table 3.
A composition comprising the said inhibitor or antagonist.
Use of the said inhibitor or antagonist as an active agent in the prepararion of a herbicidal composition.

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# INTERNATIONAL SEARCH REPORT

GB2004/001436

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| | | US 2002160915 A1 | 31-10-2002 |